Mathematical Symbols

Mathematical symbols are used to perform various operations. The symbols make it easier to refer Mathematical quantities. It is interesting to note that Mathematics is completely based on numbers and symbols. The math symbols not only refer to different quantities but also represent the relationship between two quantities. All mathematical symbols are mainly used to perform mathematical operations under various concepts.

As we know, the full name of Maths is Mathematics. It is defined as the science of calculating, measuring, quantity, shape, and structure. It is based on logical thinking, numerical calculations, and the study of shapes. Algebra, trigonometry, geometry, and number theory are examples of mathematical dimensions, and the concept of Maths is purely dependent on numbers and symbols.

There are many symbols used in Maths that have some predefined values. To simplify the expressions, we can use those kinds of values instead of those symbols. Some of the examples are the pi symbol (Ï€), which holds the value 22/7 or 3.14. The pi symbol is a mathematical constant which is defined as the ratio of circumference of a circle to its diameter. In Mathematics, pi symbol is also referred to as Archimedes constant. Also, e-symbol in Maths which holds the value e= 2.718281828â€¦.This symbol is known as e-constant or Eulerâ€™s constant. The table provided below has a list of all the common symbols in Maths with meaning and examples.

There are so many mathematical symbols that are very important to students. To understand this in an easier way, the list of mathematical symbols are noted here with definition and examples. There are numerous signs and symbols, ranging from the simple addition concept sign to the complex integration concept sign. Here, the list of mathematical symbols is provided in a tabular form, and those notations are categorized according to the concept.

List of Mathematical Symbols

Basic Mathematical Symbols With Name, Meaning and Examples

The basic mathematical symbols used in Maths help us to work with mathematical concepts in a theoretical manner. In simple words, without symbols, we cannot do maths. The mathematical signs and symbols are considered as representative of the value. The basic symbols in maths are used to express mathematical thoughts. The relationship between the sign and the value refers to the fundamental need of mathematics. With the help of symbols, certain concepts and ideas are clearly explained. Here is a list of commonly used mathematical symbols with names and meanings. Also, an example is provided to understand the usage of mathematical symbols.

Symbol Symbol Name in Maths Math Symbols Meaning Example â‰ not equal sign inequality 10 â‰ 6 = equal sign equality 3 = 1 + 2 < strict inequality greater than 6 > 2 â‰¤ inequality less than or equal to x â‰¤ y, means, y = x or y > x,

P

but not vice-versa. â‰¥ inequality greater than or equal to a â‰¥ b, means, a = b or a > b, but vice-versa does not hold true. [ ] brackets calculate expression inside first [2Ã—5] + 7 = 10 + 7 = 17 ( ) parentheses calculate expression inside first 3 Ã— (3 + 7) = 3 Ã— 10 = 30 âˆ’ minus sign subtraction 5 âˆ’ 2 = 3 + plus sign addition 4 + 5 = 9 âˆ“ minus â€“ plus both minus and plus operations 1 âˆ“ 4 = -3 and 5 Â± plus â€“ minus both plus and minus operations 5 Â± 3 = 8 and 2 Ã— times sign multiplication 4 Ã— 3 = 12 * asterisk multiplication 2 * 3 = 6 Ã· division sign / obelus division 15 Ã· 5 = 3 âˆ™ multiplication dot multiplication 2 âˆ™ 3 = 6 â€“ horizontal line division / fraction 8/2 = 4 / division slash division 6 â•„ 2 = 3 mod modulo remainder calculation 7 mod 3 = 1 ab power exponent 24 = 16 . period decimal point, decimal separator 4.36 = 4 +(36/100) âˆša square root âˆša Â· âˆša = a âˆš9 = Â±3 a^b caret exponent 2 ^ 3 = 8 4âˆša fourth root 4âˆša Â·4âˆša Â· 4âˆša Â· 4âˆša = a 4âˆš16= Â± 2 3âˆša cube root 3âˆša Â·3âˆša Â· 3âˆša = a 3âˆš343 = 7 % percent 1% = 1/100 10% Ã— 30 = 3 nâˆša n-th root (radical) nâˆša Â· nâˆša Â· Â· Â· n times = a for n=3, nâˆš8 = 2 ppm per-million 1 ppm = 1/1000000 10ppm Ã— 30 = 0.0003 â€° per-mille 1â€° = 1/1000 = 0.1% 10â€° Ã— 30 = 0.3 ppt per-trillion 1ppt = 10-12 10ppt Ã— 30 = 3Ã—10-10 ppb per-billion 1 ppb = 1/1000000000 10 ppb Ã— 30 = 3Ã—10-7

Maths Logic symbols With Meaning Symbol Symbol Name in Maths Math Symbols Meaning Example ^ caret / circumflex and x ^ y Â· and and x Â· y + plus or x + y & ampersand and x & y | vertical line or x | y âˆ¨ reversed caret or x âˆ¨ y XÌ„ bar not â€“ negation xÌ„ xâ€™ single-quote not â€“ negation xâ€™ ! Exclamation mark not â€“ negation ! x Â¬ not not â€“ negation Â¬ x ~ tilde negation ~ x âŠ• circled plus / oplus exclusive or â€“ xor x âŠ• y â‡” equivalent if and only if (iff) p: this year has 366 days

q: this is a leap year

p â‡” q â‡’ implies Implication p: a number is a multiple of 4 q: the number is even p â‡’ q âˆˆ Belong to/is an element of Set membership A = {1, 2, 3}

2 âˆˆ A âˆ‰ Not element of Negation of set membership A={1, 2, 3}

0 âˆ‰ A âˆ€ for all Universal Quantifier 2n is even âˆ€ n âˆˆ N where N is a set of Natural Numbers â†” equivalent if and only if (iff) p: x is an even number q: x is divisible by 2 p â†” q âˆ„ there does not exist Negation of existential quantifier b is not divisible by a, then âˆ„ n âˆˆ N such that b = na âˆƒ there exists Existential quantifier b is divisible by a, then âˆƒ n âˆˆ N such that b = na âˆµ because / since Because shorthand a = b, b = c â‡’ a = c (âˆµ a = b) âˆ´ therefore Therefore shorthand (Logical consequence) x + 6 = 10 âˆ´ x = 4 Calculus and Analysis Symbol Names in Maths In calculus, we have come across different math symbols. All mathematical symbols with names and meanings are provided here. Go through the all mathematical symbols used in calculus. Symbol Symbol Name in Maths Math Symbols Meaning Example Îµ epsilon represents a very small number, near-zero Îµ â†’ 0 lim xâ†’a limit limit value of a function lim xâ†’a (3x+1)= 3 Ã— a + 1 = 3a + 1 y â€˜ derivative derivative â€“ Lagrangeâ€™s notation (5x3)â€™ = 15x2 e e constant / Eulerâ€™s number e = 2.718281828â€¦ e = lim (1+1/x)x , xâ†’âˆž y(n) nth derivative n times derivation nth derivative of 3xn = 3 n (n-1)(n-2)â€¦.(2)(1)= 3n! yâ€• second derivative derivative of derivative (4x3)â€• = 24x (begin{array}{l}frac{d^2 y}{d x^2}end{array}) second derivative derivative of derivative (begin{array}{l}frac{d^2 }{d x^2}(6x^{3}+x^{2}+3x+1) = 36x + 1end{array}) dy/dx derivative derivative â€“ Leibnizâ€™s notation (begin{array}{l}frac{d }{d x}(5x) = 5end{array}) (begin{array}{l}frac{d^n y}{d x^n}end{array}) nth derivative n times derivation (begin{array}{l}frac{d^{n}x}{dx^{n}}(x^{n})=n!end{array}) (begin{array}{l}ddot{y}= frac{d^{2} y}{dt^{2}}end{array}) Second derivative of time derivative of derivative If y = 4t 2 , then (begin{array}{l}ddot{y}= frac{d^{2}y}{dt^{2}}=4frac{d^{2}}{dt^{2}}(t^{2})=8end{array}) (begin{array}{l}dot{y}end{array}) Single derivative of time derivative by time â€“ Newtonâ€™s notation y = 5t, then (begin{array}{l}dot{y}= frac{dy}{dt}=5frac{d}{dt}(t)=5end{array}) D2x second derivative derivative of derivative yâ€• + 2y + 1 = 0 â‡’ D2y + 2Dy + 1 = 0 Dx derivative derivative â€“ Eulerâ€™s notation dy/x â€“ 1 = 0 â‡’ Dy â€“ 1 = 0 âˆ« integral opposite to derivation âˆ«x n dx = x n + 1 /n + 1 + C (begin{array}{l}frac{partial f(x,y)}{partial x}end{array}) partial derivative Differentiating a function with respect to one variable considering the other variables as constant âˆ‚(x 2 +y 2)/âˆ‚x = 2x âˆ- triple integral integration of the function of 3 variables (begin{array}{l}int_{1}^{2}int_{2}^{3} int_{0}^{1}(xyz) :dz;dx;dyend{array}) âˆ¬ double integral integration of the function of 2 variables âˆ¬(x 3 +y 3)dx dy âˆ¯ closed surface integral Double integral over a closed surface âˆ- V (â››.F)dV = âˆ¯ S (F.nÌ‚) dS âˆ® closed contour / line integral Line integral over closed curve âˆ® C 2/z dz [a,b] closed interval [a,b] = {x | a â‰¤ x â‰¤ b} sin x âˆˆ [â€“ 1, 1] âˆ° closed volume integral Volume integral over a closed three-dimensional domain âˆ° (x 2 + y 2 + z 2) dx dy dz (a,b) open interval (a,b) = {x | a

eq0 \ infty& if:x=0 \end{matrix}right. end{array})

Combinatorics Symbols Used in Maths

The different Combinatorics symbols used in maths concern the study of the combination of finite discrete structures. Some of the most important combinatorics symbols used in maths are as follows:

Symbol Symbol Name Meaning or Definition Example n P k Permutation (begin{array}{l}^{n}P_{k}= frac{n!}{(n-k)!}end{array}) (begin{array}{l}^{5}P_{3}= frac{5!}{(5-3)!} = 60end{array}) n! Factorial n! = 1Ã—2Ã—3Ã—â€¦Ã—n 5! = 1Ã—2Ã—3Ã—4Ã—5 = 120 n C k Combination (begin{array}{l}^{n}C_{k}= frac{n!}{k!(n-k)!} end{array}) (begin{array}{l}^{5}C_{3}= frac{5!}{3!(5-3)!}=10end{array})

Greek Alphabet Letters Used in Maths

Mathematicians frequently use Greek alphabets in their work to represent the variables, constants, functions and so on. Some of the commonly used Greek symbols name in Maths are listed below:

Greek Symbol Greek Letter Name English Equivalent Pronunciation Upper Case Lower Case Î’ Î² Beta b be-ta Î‘ Î± Alpha a al-fa Î” Î´ Delta d del-ta Î“ Î³ Gamma g ga-ma Î– Î¶ Zeta z ze-ta Î• Îµ Epsilon e ep-si-lon Î˜ Î¸ Theta th te-ta Î— Î· Eta h eh-ta Îš Îº Kappa k ka-pa Î™ Î¹ Iota i io-ta Îœ Î¼ Mu m m-yoo Î› Î» Lambda l lam-da Îž Î¾ Xi x x-ee Î• Î½ Nu n noo ÎŸ Î¿ Omicron o o-mee-c-ron Î Ï€ Pi p pa-yee Î£ Ïƒ Sigma s sig-ma Î¡ Ï• Rho r row Î¥ Ï… Upsilon u oo-psi-lon Î¤ Ï„ Tau t ta-oo Î§ Ï‡ Chi ch kh-ee Î¦ Ï† Phi ph f-ee Î© Ï‰ Omega o o-me-ga Î¨ Ïˆ Psi ps p-see

Common Numeral Symbols Used in Maths

The roman numerals are used in many applications and can be seen in our real-life activities. The common Roman numeral symbols used in Maths are as follows.

Name European Roman Arabic Hebrew zero 0 n/a 0 n/a one 1 I Ù¡ ×• two 2 II Ù¢ ×‘ three 3 III Ù£ ×’ four 4 IV Ù¤ ×“ five 5 V Ù¥ ×” six 6 VI Ù¦ ×• seven 7 VII Ù§ ×– eight 8 VIII Ù¨ ×— nine 9 IX Ù© ×˜ ten 10 X Ù¡Ù ×™ eleven 11 XI Ù¡Ù¡ ×™×• twelve 12 XII Ù¡Ù¢ ×™×‘ thirteen 13 XIII Ù¡Ù£ ×™×’ fourteen 14 XIV Ù¡Ù¤ ×™×“ fifteen 15 XV Ù¡Ù¥ ×˜×• sixteen 16 XVI Ù¡Ù¦ ×˜×– seventeen 17 XVII Ù¡Ù§ ×™×– eighteen 18 XVIII Ù¡Ù¨ ×™×— nineteen 19 XIX Ù¡Ù© ×™×˜ twenty 20 XX Ù¢Ù ×› thirty 30 XXX Ù£Ù ×œ forty 40 XL Ù¤Ù ×ž fifty 50 L Ù¥Ù × sixty 60 LX Ù¦Ù ×¡ seventy 70 LXX Ù§Ù ×¢ eighty 80 LXXX

210.00155555556

Ù¨Ù ×¤ ninety 90 XC Ù©Ù ×¦ one hundred 100 C Ù¡Ù Ù ×§

These are some of the most important and commonly used symbols in mathematics. It is important to get completely acquainted with all the maths symbols to be able to solve maths problems efficiently. It should be noted that without knowing maths symbols, it is extremely difficult to grasp certain concepts on a universal scale. Some of the key importance of maths symbols are summarized below.

Importance of Mathematical Symbols

Helps in denoting quantities

Establishes relationships between quantities

Helps to identify the type of operation

Makes reference easier

Maths symbols are universal and break the language barrier

Frequently Asked Questions on Math Symbols What is the pi symbol in Maths? The pi symbol is a mathematical constant, which is approximately equal to 3.14. The symbol of pi is Ï€ and it is a Greek alphabet. Pi is an irrational number which is defined as the ratio of circle circumference to its diameter. What is e symbol in mathematics? The â€œeâ€• symbol in maths represents Eulerâ€™s number which is approximately equal to 2.71828â€¦It is considered as one of the most important numbers in mathematics. It is an irrational number and it cannot be represented as a simple fraction Write down the symbols for basic arithmetic operations. The symbols for basic arithmetic operations are addition (+), subtraction (-), Multiplication (Ã—), Division(Ã·). Why do we use mathematical symbols? Mathematics is a universal language and the basics of maths are the same everywhere in the universe. Mathematical symbols play a major role in this. The definition and the value of the symbols are constant. For example, the Roman letter X represents the value 10 everywhere around us. Mention the logic symbols in maths. The logic symbols in maths are:

AND (^)

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OR (âˆ¨)

NOT (Â¬)

Implies (â‡’)

Equivalent (â‡”)

For all (âˆ€)

There exists (âˆƒ)

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Reference

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